IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Docket No: Q87635
Toshihiko OKAMOTO, et al.
Appln. No.: 10/533,309 Group Art Unit: 1796
Filed : January 5, 2006 Examiner: Robert S. LOEWE
Title : CURABLE COMPOSITION AND METHODS FOR IMPROVING RECOVERY PROPERTIES AND CREEP PROPERTIES

DECLARATION UNDER RULE 132

Honorable Commissioner of Patents and Trademarks,
Alexandria, Virginia 22313-1450

Sir:

I, Toshihiko Okamoto, a citizen of Japan and having postal mailing address of 1-19-19, Nonoue, Akashi, Hyogo 673-0017, Japan, declare and say that:

In March 1994, I was graduated from Graduate School of Engineering, Osaka University, and received a master's degree in the field of chemistry;

Since April 1994, I have been employed by Kaneka Corporation and engaged in the work of research and development of modified silicone composition for sealing material in High Performance Polymers Division;

I am the inventor of the above-identified application and am familiar with the technical field of the present invention;

I respectfully submit herewith my exact report;

In order to demonstrate that the claimed inventions are patentable from the teaching by Wakabayashi et al., I have carried out the following experiments.

Object

The objective of the following experiments is to evaluate recovery properties of cured articles obtained from various curable compositions. The curable compositions were prepared, according to the same manner as the Examples described in the instant specification, using various combinations of organic polymers each having a different silicon-containing functional group (i.e. a silicon-containing functional group having two or three hydrolyzable groups on a silicon atom thereof) and various silicon compounds (i.e. a trialkoxysilane or a silicate).

Experiments

The curable compositions listed in the following table were obtained by the same manner as Examples 1-4 and Comparative Examples 1 and 2 illustrated in Table 1 of the instant specification. Recovery ratio after 100% elongation at 60°C was determined by the same manner as explained in the Examples. The results are illustrated in the following table.

In the table below, the organic polymers (A-1) and (A-10) respectively refer to organic polymers obtained by the manners of Synthesis Example 1 and Synthesis Example 10 in the instant specification.

For reference, illustrated in the following table are References Nos.1 and 2, which respectively correspond to the results of Comparative Example 1 and Example 1 in the instant specification.

Table

Composition (part(s) by weight)			References		Experiments			
			1	2	1	2	3	4
Organic polymer	A-1	Methyldimethoxy-silyl group	100	100				
	A-10 <Component (A1)>	Triethoxysilyl group			100	100	100	100
Filler		HAKUENKA CCR	120	120	120	120	120	120
		Tipaque R-820	20	20	20	20	20	20
Plasticizer		DIDP	55	55	55	55	55	55
Thixotropy-imparting agent		Disparlon #6500	2	2	2	2	2	2
Photostabilizer		Sanol LS770	1	1	1	1	1	1
Ultraviolet Absorber		Tinuvin 327	1	1	1	1	1	1
Antioxidant		Nocrac SP	1	1	1	1	1	1
Adhesion-imparting agent		A-1120	3	3	3	3	3	3
Silicon compound	Trialkoxysilane	A-171	2	2	2			
	Silicate <Component (B)>	Ethyl Silicate 28		2		2		
		Methyl Silicate 51					2	2
Curing catalyst	Organotin	Neostann U-220	2	2	2	2	2	
	Tin carboxylate salt <Component (C)>	Neostann U-50						3.4
	Carboxylic acid	Versatic 10						1.2
	Amine	Laurylamine						0.75
Recovery Ratio		%	26	54	76	82	84	92

Results

Comparison of Reference No.1 and Experiment No.1 revealed that use of the organic polymer (A1) in which the silicon-containing functional group has three or more hydrolyzable groups on one or more silicon atoms thereof enhanced recovery ratio of the curable compositions. Comparison of Experiment No.1 with Experiment Nos.2 and 3 revealed that use of the silicate (B) enhanced recovery ratio of the curable compositions. Furthermore, comparison of Experiment No.3 and Experiment No.4 revealed that use of the tin carboxylate salt (C) as a curing catalyst enhanced recovery ratio of the curable compositions.

As above, a combination of a organic polymer (Component (A1)) having one or more silicon-containing

functional groups that have a particular structure (i.e. a silicon-containing functional group having three or more hydrolyzable groups on one or more silicon atoms thereof) and a silicon compound (Component (B)) having a particular structure (i.e. a silicate) provided "a cured article excellent in recovery properties", which is one of the objects of the present invention. Use of the tin carboxylate salt (Component (C)) as a curing catalyst provided a cured article particularly excellent in recovery properties

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Signed this 26th day of June , 2009

Toshihiko Okamoto

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